

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-9. (Canceled)

Claim 10. (Withdrawn) Pharmaceutical composition intended for the treatment or prevention of a papillomavirus infection or tumor, which comprises, as therapeutic agent(s), one or more recombinant vectors into which there are inserted DNA fragments coding for:

- (1) at least one polypeptide from the early region of a papillomavirus and at least one polypeptide from the late region of a papillomavirus,
- (2) at least one polypeptide from the early region of a papillomavirus, at least one polypeptide from the late region of a papillomavirus and at least one polypeptide having an immunostimulatory activity, or
- (3) at least one polypeptide from an early or late region of a papillomavirus and at least one polypeptide having an immunostimulatory activity;

said DNA fragments being placed under the control of the elements necessary for their expression in a host cell or organism.

Claim 11. (Withdrawn) Pharmaceutical composition according to Claim 10, wherein said polypeptides are derived from E6 protein, from the E7 protein or from the E6 and E7 protein of a papillomavirus.

Claim 12. (Withdrawn) Pharmaceutical composition according to Claim 10, wherein the recombinant vector is a viral vector which can be derived from the genome of a virus selected from poxviruses, adenoviruses, retroviruses, herpesviruses and adeno-associated viruses.

Claim 13. (Withdrawn) Pharmaceutical composition according to Claim 12, wherein the recombinant vector is derived from a poxvirus selected from the group consisting of vaccinia virus, canarypox virus and fowlpox virus.

Claim 14. (Withdrawn) Pharmaceutical composition according to Claim 13, wherein the recombinant vector is derived from a vaccinia virus selected from the Copenhagen, Wyeth and modified Ankara (MVA) strains.

Claim 15. (Withdrawn) Pharmaceutical composition according to Claim 13, wherein the elements essential for the expression of the DNA fragments coding for said polypeptides comprise a promoter of a gene of a vaccinia virus selected from the promoters of the thymidine kinase (TK), 7.5K, H5R and K1L genes.

Claim 16. (Withdrawn) Pharmaceutical composition according to Claim 14, wherein the recombinant vector is derived from a vaccinia virus of the Copenhagen strain and in that the DNA fragments coding for said polypeptides are inserted into the TK locus and/or the K1L locus of said vaccinia virus.

Claim 17. (Withdrawn) Pharmaceutical composition according to Claim 14, wherein the recombinant vector is derived from a vaccinia virus of the MVA strain and in that the DNA fragments coding for said polypeptides are inserted at the level of any of the excision zones selected from the I, II, III, IV, V and VI excisions of said vaccinia virus.

Claim 18. (Withdrawn) Pharmaceutical composition according to Claim 10, intended for the treatment or prevention of a papillomavirus infection or tumor, characterized in that it comprises one or more recombinant vectors derived from the Copenhagen or MVA strain of a vaccinia virus into which there are inserted:

- (1) a DNA fragment coding for the ES protein of a papillomavirus, a DNA fragment coding for the E7 protein of a papillomavirus and a DNA fragment coding for the molecule B7.1,
- (2) a DNA fragment coding for the E6 protein of a papillomavirus, a DNA fragment coding for the E7 protein of a papillomavirus and a DNA fragment coding for interleukin-2,

- (3) a DNA fragment coding for the ES protein of a papillomavirus, a DNA fragment coding for the E7 protein of a papillomavirus, a DNA fragment coding for the molecule B7.1 and a DNA fragment coding for interleukin-2,
- (4) a DNA fragment coding for the ES protein of a papillomavirus, a DNA fragment coding for the E7 protein of a papillomavirus, a DNA fragment coding for the L1 protein of a papillomavirus and a DNA fragment coding for the L2 protein of a papillomavirus,
- (5) a DNA fragment coding for the ES protein of a papillomavirus, a DNA fragment coding for the E7 protein of a papillomavirus, a DNA fragment coding for the L1 protein of a papillomavirus, a DNA fragment coding for the L2 protein of a papillomavirus and a DNA fragment coding for the molecule B7.1,
- (6) a DNA fragment coding for the ES protein of a 5 papillomavirus, a DNA fragment coding for the E7 protein of a papillomavirus, a DNA fragment coding for the L1 protein of a papillomavirus, a DNA fragment coding for the L2 protein of a papillomavirus and a DNA fragment coding for interleukin-2, or
- (7) a DNA fragment coding for the ES protein of a papillomavirus, a DNA fragment coding for the E7 protein of a papillomavirus, a DNA fragment coding for the L1 protein of a papillomavirus, a DNA fragment coding for

the L2 protein of a papillomavirus, a DNA fragment coding for the molecule B7.1 and a DNA fragment coding for interleukin-2.

Claim 19. (Withdrawn) Pharmaceutical composition according to Claim 10, intended for the prevention of a papillomavirus infection or tumor, characterized in that it comprises one or more recombinant vectors derived from the Copenhagen or MVA strain of a vaccinia virus, into which there are inserted:

- (1) a DNA fragment coding for the L1 protein of a 25 papillomavirus, a DNA fragment coding for the L2 protein of a papillomavirus and a DNA fragment coding for the molecule B7.1,
- (2) a DNA fragment coding for the L1 protein of a papillomavirus, a DNA fragment coding for the L2 protein of a papillomavirus and a DNA fragment coding for interleukin-2, or a DNA fragment coding for the L1 protein of a papillomavirus, a DNA fragment coding for the L2 protein of a papillomavirus, a DNA fragment coding for interleukin-2 and a DNA fragment coding for the molecule B7.1.

Claim 20. (Withdrawn) Pharmaceutical composition according to Claim 10, wherein the recombinant vector is alive or killed.

Claims 21-24. (Canceled)

Claim 25. (Withdrawn) Pharmaceutical composition according to Claim 10, wherein said early region polypeptide is a nononcogenic variant of the E6 and/or E7 protein of a papillomavirus.

Claim 26. (Withdrawn) Pharmaceutical composition according to Claim 10, wherein said late region polypeptide is derived from the L1 protein, the L2 protein or from the L1 and L2 proteins.

Claim 27. (Withdrawn) Pharmaceutical composition according to Claim 10, wherein said polypeptide having immunostimulatory activity is selected from the group consisting of interleukin-2, interleukin-7, interleukin-12 and the co-adhesion molecules B7.1 and B7.2.

Claim 28. (Withdrawn) Pharmaceutical composition according to Claim 27, wherein said polypeptide having immunostimulatory activity is derived from interleukin-2.

Claim 29. (Withdrawn) Pharmaceutical composition according to Claim 27, wherein said polypeptide having immunostimulatory activity is derived from the molecule B7.1.

Claim 30. (Withdrawn) Pharmaceutical composition according to Claim 10,
comprising:

- (1) a polypeptide from the E6 region, a polypeptide from the E7 region, a polypeptide from the L1 region and a polypeptide from the L2 region of a papillomavirus;
- (2) a polypeptide from the E6 region, a polypeptide from the E7 region of a papillomavirus and a polypeptide derived from interleukin-2;
- (3) a polypeptide from the E6 region, a polypeptide from the E7 region of a papillomavirus and a polypeptide derived from the molecule B7.1;
- (4) a polypeptide from the E6 region, a polypeptide from the E7 region of a papillomavims, a polypeptide derived from the molecule B7.1 and a polypeptide derived from interleukin-2;
- (5) a polypeptide from the E6 region, a polypeptide from the E7 region, a polypeptide from the L1 region, a polypeptide from the L2 region of a papillomavirus and a polypeptide derived from interleukin-2;
- (6) a polypeptide from the E6 region, a polypeptide from the E7 region, a polypeptide from the L1 region, a polypeptide from the L2 region of a papillomavirus and a polypeptide derived from the molecule B7.i; or
- (7) a polypeptide from the E6 region, a polypeptide from the E7 region, a polypeptide from the L1 region, a polypeptide from the L2 region of a

papillomavirus, a polypeptide derived from the molecule B7.1 and a polypeptide derived from interleukin-2.

Claim 31. (Withdrawn) Pharmaceutical composition according to Claim 10, wherein the papillomavirus is selected from the group consisting of HPV-16, HPV-18, HPV-3 1, HPV-33 and HPV-45.

Claims 32-78. (Canceled)

Claim 79. (Currently Amended) A pharmaceutical composition for the treatment or prevention of a papillomavirus infection or tumor, consisting essentially of a combination of early and late papillomavirus polypeptides consisting of a polypeptide from the E6 region of a papillomavirus, a polypeptide from the E7 region of a papillomavirus, a polypeptide from the L1 region of a papillomavirus and a polypeptide from the L2 region of a papillomavirus to stimulate specific immunity towards the papillomavirus in the absence of specific immunity.

Claim 80. (Previously Presented) The pharmaceutical composition according to claim 79, wherein the polypeptide from the early E6 region is a nononcogenic variant of the native E6 protein of a papillomavirus having amino acids 111-115 deleted as compared to said native E6 protein.

Claim 81. (Canceled)

Claim 82. (Previously Presented) The pharmaceutical composition according to claim 80, wherein said human papillomavirus is HPV-16.

Claim 83. (Previously Presented) The pharmaceutical composition according to claim 79, wherein the polypeptide from the early E7 region is a nononcogenic variant of the native E7 protein of a papillomavirus having amino acids 21-26 deleted as compared to said native E7 protein.

Claim 84. (Canceled)

Claim 85. (Previously Presented) The pharmaceutical composition according to claim 83, wherein said human papillomavirus is HPV-16.

Claim 86. (Withdrawn) The pharmaceutical composition according to claim 79, wherein said polypeptides of a papillomavirus are expressed from independent expression control elements.

Claim 87. (Previously Presented) The pharmaceutical composition of claim 79, wherein said papillomavirus is selected from the group consisting of HPV-16, HPV-18, HPV-31, HPV-33 and HPV-45 types.

Claim 88. (Previously Presented) The pharmaceutical composition of claim 79, comprising a pharmaceutically acceptable carrier for administration of said composition by injection into humans or into animals.

Claim 89. (Previously Presented) A method for the treatment or prevention of dysplasia or cancer of the neck of the uterus caused by a papillomavirus, comprising administering an effective amount of the pharmaceutical composition of claim 79, to a patient in need of such treatment.

Claim 90. (Previously Presented) A method for the treatment or prevention of a papillomavirus infection, comprising administering an effective amount of the pharmaceutical composition of claim 79, to a patient in need of such treatment.

28
Claim 91. (Currently Amended) A pharmaceutical composition for the treatment or prevention of a papillomavirus infection or tumor, consisting essentially of a combination of early and late papillomavirus polypeptides consisting of a polypeptide from the E6 region of a papillomavirus, a polypeptide from the E7 region of a papillomavirus, a

12
polypeptide from the L1 region of a papillomavirus and a polypeptide from the L2 region of a papillomavirus to stimulate specific immunity towards the papillomavirus and at least one polypeptide having an immunostimulatory activity selected from the group consisting of interleukin-2, and interleukin-7, ~~the co-adhesion molecule B7.1 and the co-adhesion molecule B7.2~~ to stimulate a specific immunity.

Claim 92. (Previously Presented) The pharmaceutical composition according to claim 91, wherein the polypeptide from the early E6 region is a nononcogenic variant of the native E6 protein of a papillomavirus having amino acids 111-115 deleted as compared to native E6 protein.

Claim 93. (Canceled)

Claim 94. (Previously Presented) The pharmaceutical composition according to claim 92, wherein said human papillomavirus is HPV-16.

Claim 95. (Previously Presented) The pharmaceutical composition according to claim 91, wherein the polypeptide from the early E7 region is a nononcogenic variant of the native E7 protein of a papillomavirus having amino acids 21-26 deleted as compared to said native E7 protein.

Claim 96. (Canceled)

Claim 97. (Previously Presented) The pharmaceutical composition according to claim 95, wherein said human papillomavirus is HPV-16.

Claim 98. (Previously Presented) The pharmaceutical composition according to claim 91, wherein the polypeptide having an immunostimulatory activity is interleukin-2.

Claim 99. (Canceled)

Claim 100. (Withdrawn) The pharmaceutical composition according to claim 91, wherein said early and late papillomavirus polypeptides and said polypeptide having an immunostimulatory activity are expressed from independent expression control elements:

Claim 101. (Previously Presented) The pharmaceutical composition according to claim 91, wherein said composition consists of:

- (a) a nononcogenic variant of an E6 protein of a human papillomavirus, wherein said nononcogenic variant is a variant of the native E6 protein having amino acids 111-115 deleted as compared to the native E6 protein,

- (b) a nononcogenic variant of an E7 protein of a human papillomavirus, wherein said nononcogenic variant is a variant of the native E7 protein having amino acids 21-26 deleted as compared to the native E7 protein,
- (c) a polypeptide from the L1 region of a human papillomavirus,
- (d) a polypeptide from the L2 region of a human papillomavirus, and
- (e) interleukin-2.

Claim 102. (Previously Presented) The pharmaceutical composition according to claim 101, wherein said human papillomavirus is HPV-16.

Claim 103. (Previously Presented) The pharmaceutical composition according to claim 91, wherein said papillomavirus is selected from the group consisting of HPV-1 6, HPV-1 8, HPV-31, HPV-33 and HPV-45 types.

Claim 104. (Previously Presented) The pharmaceutical composition according to claim 91, comprising a pharmaceutically acceptable carrier for administration of said composition by injection into humans or into animals.

Claim 105. (Previously Presented) A method for the treatment or prevention of dysplasia or cancer of the neck of the uterus caused by a papillomavirus, comprising

administering an effective amount of the pharmaceutical composition according to claim 91, to a patient in need of such treatment.

Claim 106. (Previously Presented) A method for the treatment or prevention of a papillomavirus infection, comprising administering an effective amount of the pharmaceutical composition according to claim 91, to a patient in need of such treatment.

Claim 107. (Previously Presented) A method for the treatment or prevention of dysplasia or cancer of the neck of the uterus caused by a papillomavirus, comprising administering an effective amount of the pharmaceutical composition according to claim 101, to a patient in need of such treatment.

23
Claim 108. (Currently Amended) A pharmaceutical composition for the treatment of a papillomavirus infection or tumor, consisting essentially of a combination of polypeptides from the early region of a papillomavirus to stimulate specific immunity towards the papillomavirus and at least one polypeptide having an immunostimulatory activity to stimulate a specific immunity, wherein said combination of polypeptides from the early region of a papillomavirus consists in the E6 and the E7 polypeptides and wherein said polypeptide having an immunostimulatory activity is selected from the group consisting of interleukin-2, and interleukin-7, ~~the co-adhesion molecule B7.1 and the co-adhesion molecule B7.2.~~

Claim 109. (Previously Presented) The pharmaceutical composition according to claim 108, wherein the polypeptide from the early region of a papillomavirus is a nononcogenic variant of the native E6 protein of a papillomavirus having amino acids 111-115 deleted as compared to said native E6 protein and/or a nononcogenic variant of the native E7 protein of a papillomavirus having amino acids 21-26 deleted as compared to said native E7 protein.

Claim 110. (Previously Presented) The pharmaceutical composition according to claim 108, wherein the polypeptide having an immunostimulatory activity is interleukin-2.

Claim 111. (Canceled)

Claim 112. (Withdrawn) The pharmaceutical composition according to claim 108, wherein said polypeptide from the early region of a papillomavirus and said said polypeptide having an immunostimulatory activity are expressed recombinantly from independent expression control elements.

Claim 113. (Previously Presented) The pharmaceutical composition according to claim 108, wherein said composition consists of:

- (a) a nononcogenic variant of an E6 region of a human papillomavirus, wherein said nononcogenic variant is a variant of the native E6 protein having amino acids 111-115 deleted as compared to the native E6 protein;
- (b) a nononcogenic variant of an E7 region of a human papillomavirus, wherein said nononcogenic variant is a variant of the native E7 protein having amino acids 21-26 deleted as compared to the native E7 protein; and
- (c) interleukin 2.

Claim 114. (Previously Presented) The pharmaceutical composition of claim 113, wherein said human papillomavirus is HPV-16.

Claim 115. (Previously Presented) The pharmaceutical composition of claim 108, wherein said papillomavirus is selected from the group consisting of HPV-16, HPV-18, HPV-31, HPV-33 and HPV-45 types.

Claim 116. (Previously Presented) The pharmaceutical composition of claim 108, comprising a pharmaceutically acceptable carrier for administration of said composition by injection into humans or into animals.

Claim 117. (Previously Presented) A method for the treatment of dysplasia or cancer of the neck of the uterus caused by a papillomavirus, comprising administering an

effective amount of the pharmaceutical composition according to claim 108, to a patient in need of such treatment.

Claim 118. (Previously Presented) A method for the treatment of dysplasia or cancer of the neck of the uterus caused by a papillomavirus, comprising administering an effective amount of the pharmaceutical composition according to claim 113, to a patient in need of such treatment.


Claim 119. (Previously Presented) A method for the treatment of a papillomavirus infection, comprising administering an effective amount of the pharmaceutical composition according to claim 108, to a patient in need of such treatment.

Claim 120. (Previously Presented) A method for the treatment of a papillomavirus infection, comprising administering an effective amount of the pharmaceutical composition according to claim 113, to a patient in need of such treatment.

Claim 121. (New) A pharmaceutical composition for the treatment or prevention of a papillomavirus infection or tumor, consisting of a combination of early and late papillomavirus polypeptides consisting of a polypeptide from the E6 region of a papillomavirus, a polypeptide from the E7 region of a papillomavirus, a polypeptide from the L1 region of a papillomavirus and a polypeptide from the L2 region of a papillomavirus

to stimulate specific immunity towards the papillomavirus in the absence of specific immunity, and a pharmaceutically acceptable carrier.

Claim 122. (New) A pharmaceutical composition for the treatment or prevention of a papillomavirus infection or tumor, consisting of a combination of early and late papillomavirus polypeptides consisting of a polypeptide from the E6 region of a papillomavirus, a polypeptide from the E7 region of a papillomavirus, a polypeptide from the L1 region of a papillomavirus and a polypeptide from the L2 region of a papillomavirus to stimulate specific immunity towards the papillomavirus and at least one polypeptide having an immunostimulatory activity selected from the group consisting of interleukin-2, and interleukin-7, to stimulate a specific immunity, and a pharmaceutically acceptable carrier.



Claim 123. (New) A pharmaceutical composition for the treatment of a papillomavirus infection or tumor, consisting of a combination of polypeptides from the early region of a papillomavirus to stimulate specific immunity towards the papillomavirus and at least one polypeptide having an immunostimulatory activity to stimulate a specific immunity, wherein said combination of polypeptides from the early region of a papillomavirus consists in the E6 and the E7 polypeptides and wherein said polypeptide having an immunostimulatory activity is selected from the group consisting of interleukin-2, and interleukin-7, and a pharmaceutically acceptable carrier.
